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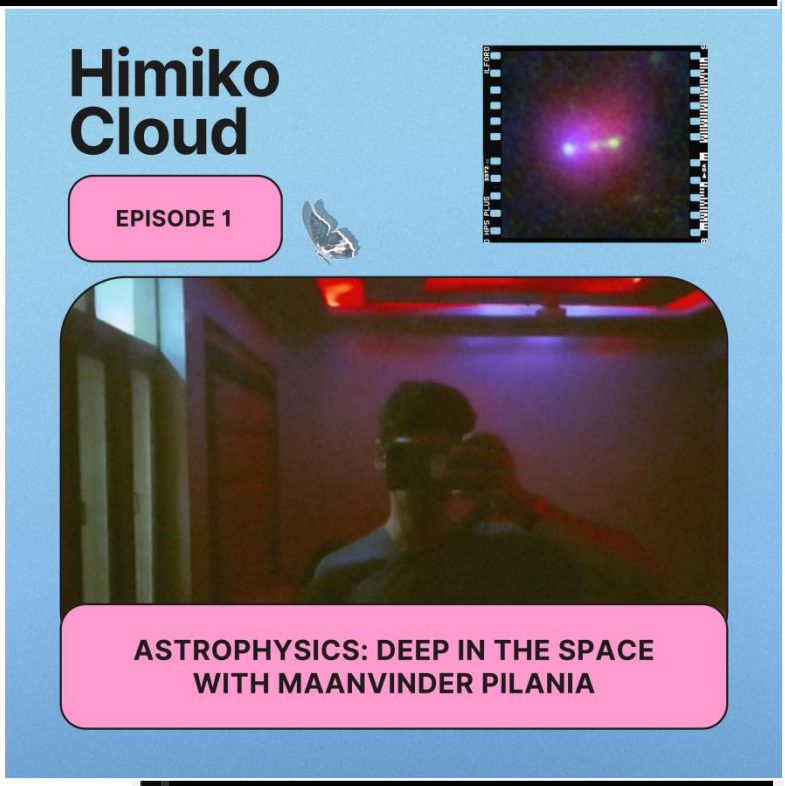
S2 EP1: The Mysterious Himiko Cloud



Maanvinder Pilania

Astrophysics: Deep in The Space With Maanvinder Pilania

The Mysterious Himiko Cloud

Hello, Ciao, Bonjour everyone. What's up guys? Finally, I'm back with Season 2 of this podcast. I know y'all waited for over a year for it to start airing but its finally here. Today I will tell y'all about a mysterious object in our cosmos which is called Himiko Cloud. Confusing right? So let me break it down in simple terms.

Before we understand what this Himiko cloud is, you need to know what a lyman-alpha blob is. Because that is what this Himiko Cloud is. In astronomical terms, a Lyman-alpha blob or LAB is a huge concentration of hydrogen gas that emits the ultraviolet light of the Lyman-alpha emission line. They are the size of galaxies with some of them being more than 400,000 light years across. They are one of the largest objects in the universe. They are the early stage of the formation of galaxies. Now you might wonder what this lyman-alpha emission line is. So let's make it easier to understand. Lyman-alpha is a spectral line of hydrogen spectrum which is emitted when the electronic transition takes place from 2^{nd} orbital to the ground state, releasing a photon in the process which is basically the UV light photon. I'm moving forward in this topic thinking y'all know what this electronic transition is. You need to have this basic knowledge in order to better understand what exactly LAB is. Also, as they are UV light photons so how do we see them? The answer is as they are so far away, billions of years, their light gets red-shifted to the optical part of the electromagnetic spectrum. Moving forward, now that you know about lyman-alpha emission line, let's talk about our Himiko Cloud.

Himiko Cloud was discovered back in 2009 and is indeed an object of interest for the astronomers because it existed at a time when our universe was only 800 million years old compared to today's 13.1 billion years. It was found at a distance of 12.9 billion light-years and spans some 55,000 light-years. The speed of light is finite. It means the light from this object arrived in 2009 after travelling 12.9 billion light years. So we are seeing it how it looked like as it was 12.9 billion years ago.

The radial velocity of this object is 289575 km/s. Radial Velocity is the speed at which an object in space is travelling away or towards the space. If the speed is in negative then that means the object is coming towards the Sun but if the value is positive, it means the object is going away, which is true in the case of the Himiko Cloud. It is moving away from the Sun with the expansion of universe.

Located in the constellation Cetus, it was named by the scientists after one of the mysterious 3^{rd} century Japanese Shaman queen Himiko. Imagine how massive this object could be? According to astronomers, it is roughly equivalent to the mass of 40 billion Suns. This object remains a very big mystery to the astronomers till today.

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